The Excavating Engineer

Vol. 16 MAY 1922 No. 5

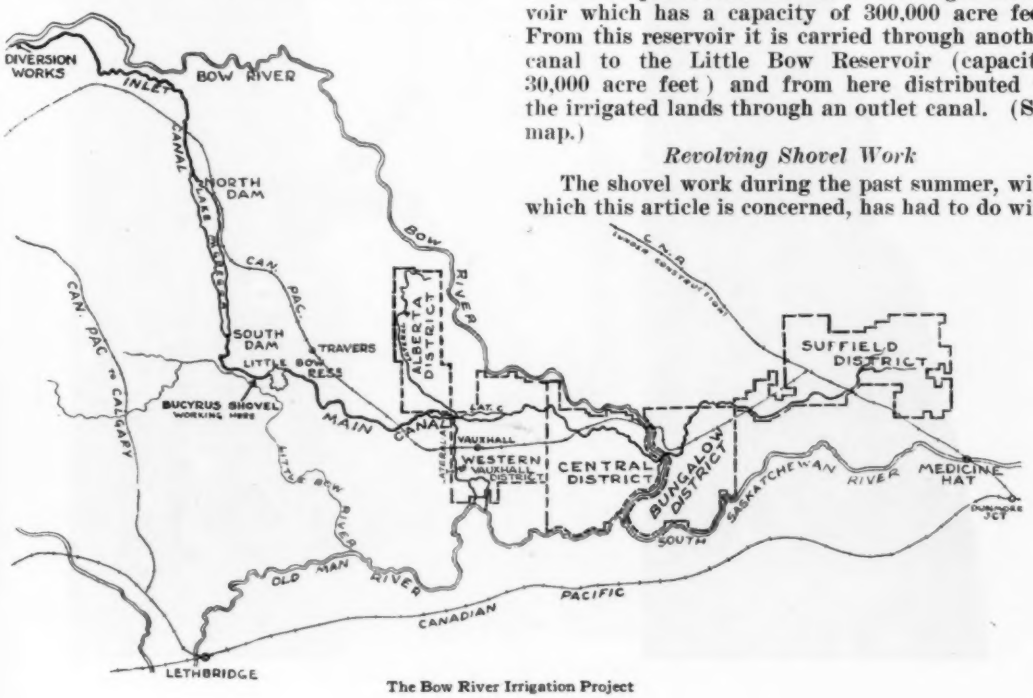
Revolving Shovel Operation on Bow River Irrigation Project, Alberta, Can.

One-yard shovel used for strengthening, enlarging and straightening canal system by the Canada Land & Irrigation Company, Limited. Description of methods of operation with detailed costs for season's work.

General Description of Project

ONLY two years ago the country lying west of Medicine Hat in Southeastern Alberta was a wide expanse of virgin prairie, unbroken, except for a few winding trails and with no covering except the natural prairie grass. During the past two years these old trails have been replaced by well-graded roads running along section lines; telephone lines connect up-to-date farmsteads, and heads of cattle graze where antelope and coyote held free sway. This extraordinary change has been largely due to the operations of the Canada Land & Irrigation Company, Ltd., of London, Eng., and Medicine Hat, Alta. This project, called the Bow River Irrigation Project, occupies the district lying between the Bow and the Old Man Rivers just west of Medicine Hat. The entire project comprises more than 500,000 acres of which 200,000 acres are irrigable. This project is divided into five main districts. Of these the western or Vauxhall Irrigated District around the town of Vauxhall is the first to be irrigated. This district comprises altogether 94,000 acres of which 50,000 are irrigable.

The water is obtained from the Bow River and is carried through an inlet canal with a flow of 1300 cubic feet per second into Lake McGregor Reservoir which has a capacity of 300,000 acre feet. From this reservoir it is carried through another canal to the Little Bow Reservoir (capacity, 30,000 acre feet) and from here distributed to the irrigated lands through an outlet canal. (See map.)



The Bow River Irrigation Project

Revolving Shovel Work

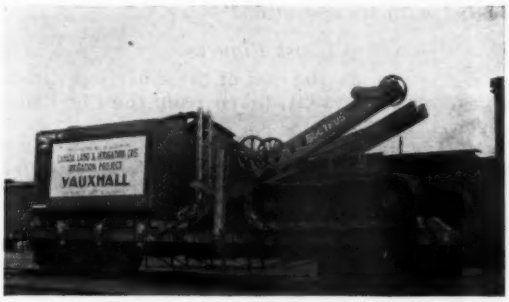
The shovel work during the past summer, with which this article is concerned, has had to do with

These views show the maximum cutting. The material is very stiff clay and shale as may be seen from the teeth marks. The material is loaded into two-yard dump wagons and deposited in a very sharp hairpin bend. This bend will be completely filled and the degree of curvature of the canal reduced.

The second day on the job. Mr. Sullivan pauses for a swig from the water bag.

The minimum cutting. Note pump for supplying shovel with water, in foreground.

the straightening, enlarging and strengthening of the canal connecting the two reservoirs. (See map.) There are in all 2½ miles of this Company's canal, in the particular section in which the steam shovel is now working, requiring enlargement



Loaded on a Flat Car on the Way to the Job

from a 36 to a 54-foot bottom width to care for future requirements.

This section of the canal is located on a comparatively steep side hill, which is clearly shown from our accompanying illustrations.

The material is a very stiff clay and shale; the character of this is also well shown by one of our views.

Problems Presented

Two main problems presented themselves in this work. One was the proper disposition of the material so as to be of the greatest service in the building and strengthening of the lower bank. The other, the necessity of planning the work in such a manner that the flow of the water in the canal was not interrupted, as the work could only be carried on during the operating season.

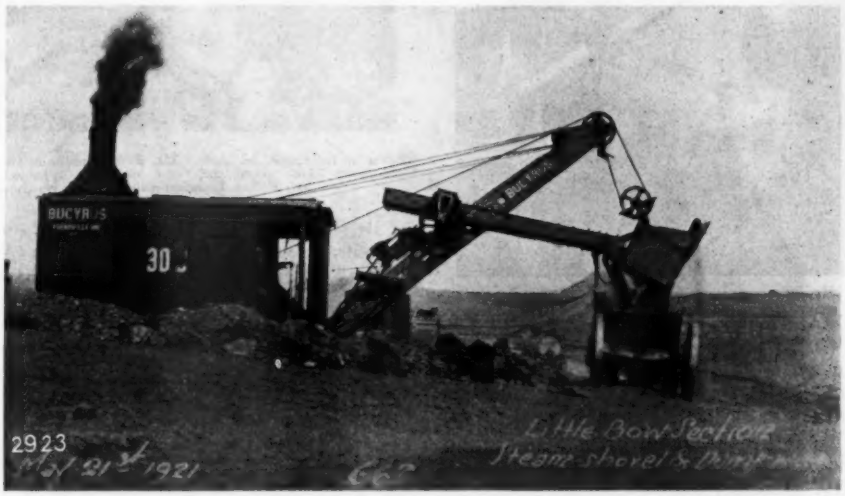
Method Adopted

A 30-B Bucyrus revolving shovel was purchased in April. This machine carried a one-yard dipper and was mounted on caterpillars. It was put to work on May 20th. This shovel, served by two-yard dump wagons, excavated down as close to the water line of the canal as safety would permit. The material was hauled away and deposited where it was of most service for strengthening the banks, and reducing the curvature of the canal.

The shovel will be followed by a 2-yard dragline excavator. This machine will operate on the bench left by the shovel, will remove the remainder of the material and cast it over the lower bank on the opposite side of the canal, thus widening the canal to the new dimensions.

Camp buildings were built on skids so that they could be kept conveniently close to the shovel.

Three portable bridges were constructed of the type shown in one of our views on page 134.



Loading a 2-yard Dump Wagon

Two of these were being used while the third was being erected at the next point. The purpose of these bridges was to carry the dump wagons across the canal and back to the shovel at points selected to cut the haul to the minimum.

Shovel Performance

The shovel arrived at Travers, a point on the Suffield-Blackie Branch of the Canadian Pacific Railway, on May 8, 1921. Here it was immediately erected and moved under its own power on May 18th. Work was started on May 20th and continued without stopping until August 16th.

During this time it moved 45,000 cubic yards. One shift of ten hours was worked. The average haul was from 300 to 800 feet. The average daily output over this period was 600 cubic yards.

The shovel was operated by R. B. Sullivan of Calgary, an old-timer at the game. By the time this issue reaches our readers operations for the 1922 season will have been begun, with Mr. Sullivan again at the levers.

The work was in charge of Mr. J. L. Franzen, Chief Engineer, to whose courtesy we are indebted for the above information. We hope at a later date to publish more information together with more detailed data covering the shovel operations, which Mr. Franzen has been kind enough to promise.

Mr. Franzen writes as follows regarding the shovel performance: "Two or three hours were the only lost time due to the machine during the entire season. Two days were lost, however, due to other causes. The machine worked satisfactorily in every way, and we would say that we were well pleased with its operation."

Cost Figures

We give below the cost of the shovel operations for the season of 1921, taken from the Company's ledger.

Engineering and Superintendent	$ 40.00
Timekeeping	104.21
Foreman of Team Outfit	138.50
Shovel Operation (Engineer and Fireman)	2,518.95
Fuel (Including Hauling)	2,329.19
Water all charges	114.00
Repair Parts	392.00
Supplies	1,012.57
Shop Expense	1.10
Ground Men	639.23
Trimming, including dump man	219.35
Teams and men on dump wagons	4,844.33
Bridges (Including moving, etc.)	572.74
Watchman	319.42
Depreciation	546.81
Camp Construction and Maintenance	500.00
Total	$14,292.40

It is interesting to note from one of our views that the camp buildings were built on skids so that they could be kept conveniently close to the shovel.

Filling Stump Holes with a Caterpillar-Mounted Revolving Shovel

P. S. Needham of Memphis, Tennessee, a veteran shovel operator, has described to us a job on which he was engaged a short time ago which

The cut through virgin Mississippi timber. The shovel has the boom lowered to increase the reach.

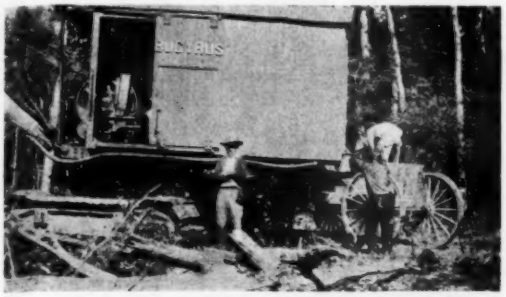
illustrates in a striking manner the multitude of uses to which a small revolving shovel mounted on caterpillars may be put, and brings out very strongly the great advantage of this type of mounting for work of this description, which requires great mobility.

Mr. Needham states that he was operating a

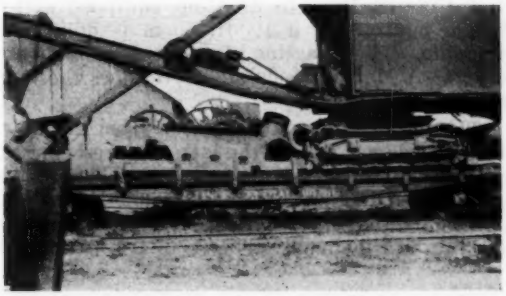
Firing up for the P. M. shift. Mr. P. S. Needham, the operator of the Bucyrus 14-B, is on the right, enjoying a large-size sandwich. Mr. Eaton, foreman on the job, is on the left.

14-B Bucyrus shovel owned by the George W. Turner & Company of Memphis in Grenada County, Mississippi. May Brothers Lumber Company of Memphis had rented this machine from Mr. Turner in connection with the construction of a logging road through a tract of virgin timber. The length of this particular road on which the shovel was used is 5¾ miles. The shovel was used for filling stump holes where they had been blasted out of the right-of-way. The material for this filling was obtained by the shovel outside of the ditch lines, these lines being 42 feet apart. Consequently as may be seen, the course of the

shovel was one continuous zigzag from one side of the right-of-way to the other. Care had to be taken, of course, not to molest the lines of the ditches. Mr. Needham estimates that the shovel traveled nearly double the distance of the line or about ten miles. The shovel was followed by a tractor and grader which dug the ditches and finished the grade. The work was completed in thirty-two days.



Coaling Up During the Noon Hour to Save Time



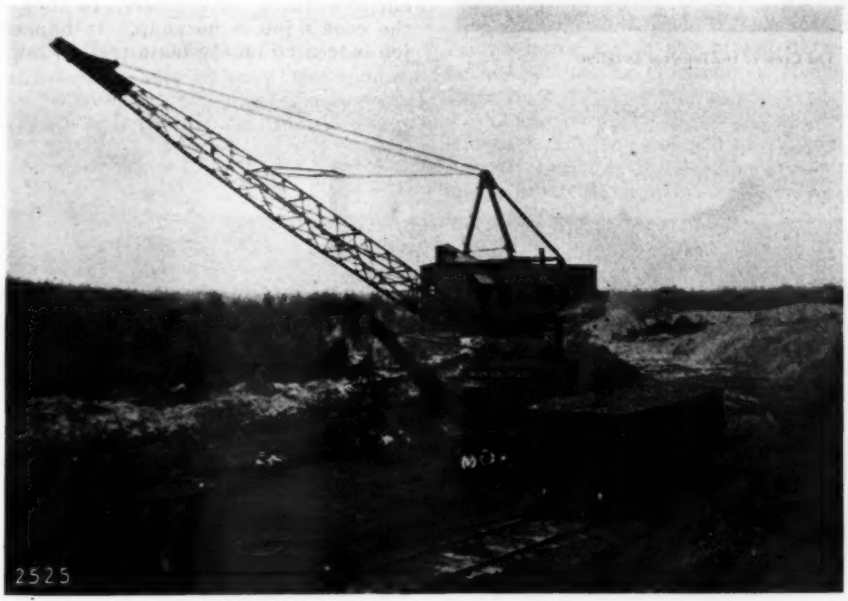
The Bucyrus Shovel "Memphis bound" on a flat car. Aside from taking off the stack no dismantling was necessary.

Stripping Coal with a Dragline

An Up-to-date Coal Stripping Plant in New Brunswick Operated by the Reade Construction Company, Limited

THE Reade Construction Company, Ltd., who are well known in eastern Canada, are now working on a coal stripping job in New Brunswick. Their property is located 5 miles south of Minto, and they are stripping and loading with up-to-date equipment.

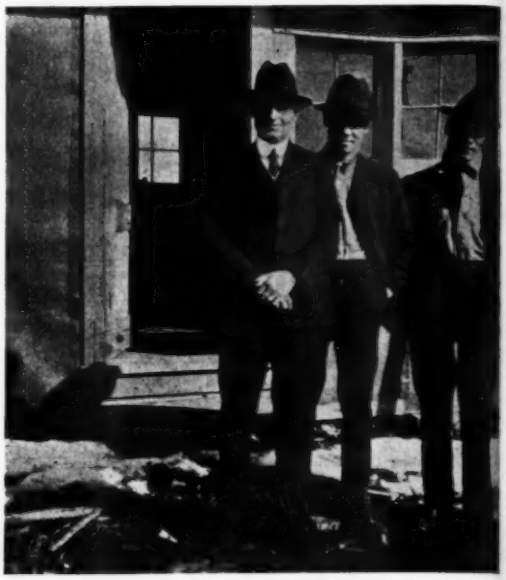
The coal seam averages about 12 inches in thickness, and is covered with 10 feet of overburden. This overburden is a mixture of red clay and stones, with about 20 per cent hard clay. The area of the coal deposit is about three square miles.



The Class-24 Bucyrus dragline stripping with the Marion Model 28 loading coal in the foreground. A car has just been filled.

A Class-24 Bucyrus dragline, equipped with a 3½-yd. bucket and a 100-ft. boom is doing this stripping. This dragline is mounted on skids and rollers. A Marion Model 28 shovel does the loading.

The dragline output has been from 40,000 to 50,000 yards per month, the latter figure being the highest month's output to date. The coal is loaded by the Marion shovel direct into gondola cars. As high as 325 tons of coal have been loaded into the cars in a nine-hour day. The coal is of very good quality, averaging 12,800 B.T.U.'s, and is very free burning.

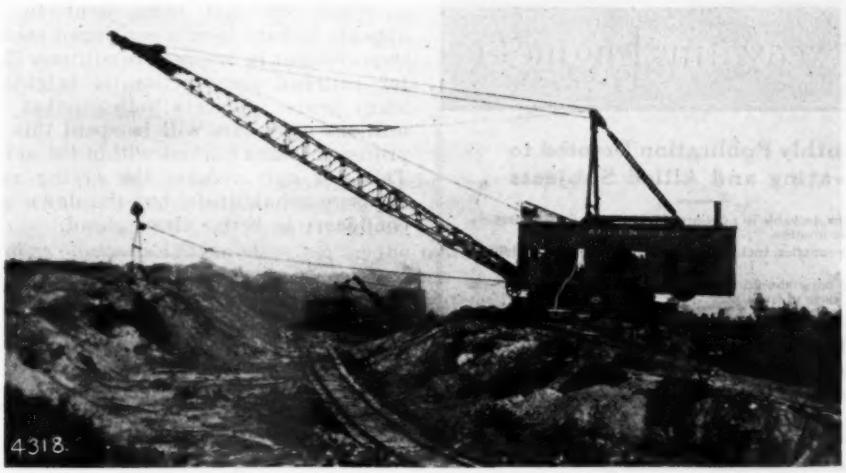


From left to right, Mr. G. H. Hutchinson of the General Equipment Company, Mr. D. B. Tees, Secretary-Treasurer of the Reade Construction Company and Mr. R. J. Tees, Master Mechanic.

The Crew of the Bucyrus Dragline

One of the most important men on the job is Mr. J. B. Baggett who feeds the bunch. The entire working force consists of about 40 men and the cook's job is no snap. It happens that this job is located on the main trail of migrating fowl,

The Marion Shovel Getting a Dipperful of Coal



Dropping a bucketful of clay on the spoil pile. The dragline is equipped with a 100-ft. boom.

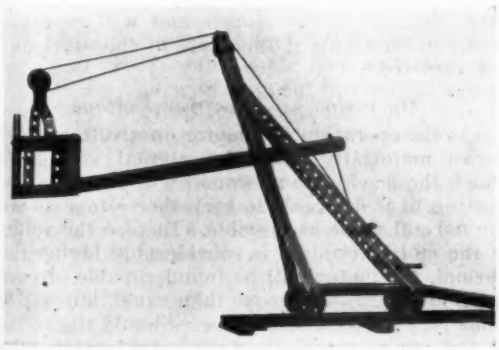
and the food served up by Chef Baggett is so good that even the migrating birds stop long enough to feed at the mess shack, which seems to be a pretty good testimonial to the chef's ability.

All the employees of the Reade Construction Company are shareholders in the company. Mr. L. W. Reade, President of the company, has had a wide experience in railway contracting, and besides his interest in the stripping operations at Minto operates several shaft mines in this district. There are two or three years' work in sight on the stripping job. Mr. G. A. Tees is Vice-President of the company and Mr. D. B. Tees, Secretary and Treasurer. In addition to his duties as Vice-President, G. A. Tees operates the Bucyrus dragline. The Marion shovel is operated by E. W. Hein.

We are indebted to Mr. D. B. Tees for the information used in this article. Mr. Tees played a prominent part in the organization of the stripping proposition, and a very large share of the success which the company has achieved has been due to his efforts.

The Latest Thing in Steam Shovels

This month we are able to show our readers an exclusive photograph of the latest development in shovel design. It is the invention of a foreign engineer and we understand it has not yet been covered by patents. The engineer, Master N. Ryk, is eleven years old and lives in Utrecht, Holland.



A New Shovel Design

In the letter which accompanied the photograph he states that he constructed the model with a Meccano outfit.

As the photograph shows, an additional rope is attached to the end of the dipper sticks, which greatly increases the digging power of the shovel and is particularly valuable when working in hard material.

We do not hesitate to predict a brilliant career for Master Ryk, in case he decides to enter the dirt-moving game later in life.

What Did the Engineer Slip Him?

A green brakeman was making his first trip up the Sierras. The train was going up a very steep grade, and with unusual difficulty the engineer succeeded in reaching the top. At the station, looking out of his cab, the engineer saw the new brakeman and said with a sigh of relief:

"I tell you what, my lad, we had a hard job to get up there, didn't we?"

"We certainly did," said the brakeman, "and if I hadn't put on the brakes, we'd have slipped back."

—*The Virginia.*

Thirsty days have September,
April, June and November,
All the rest are thirsty too,
Unless you have your own home brew.

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Bradlee Van Brunt, Manager and Editor

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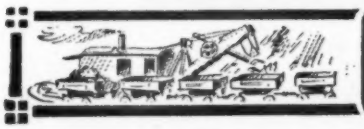
Since our last issue went to press there appears to have been a continued steady but sure improvement in business conditions. The prospect for railroad construction is brighter than for many years. Reports indicate that hundreds of millions of dollars will be spent this year on improvements and billions within the next few years. This not only reflects the crying needs of the roads to rehabilitate, but the dawn of a healthy confidence in better times ahead.

Something to be Thankful For

Elephants are carried on the railways of the Federated Malay States for 25 cents a mile, elepnant calves at 12½ cents, bears, crocodiles, panthers, tigers and other similar animals in crates, cases or baskets, half cent a mile. Presumably the first-mentioned rates, says a Straits paper, have been framed for circuses. Snakes in baskets or cages go at parcel rate.



· FIELD NOTES ·

Maintenance and Upkeep of Motors on Electric Shovels and Dragline Excavators

V. Overheating of A. C. Motors on Electric Shovels and Dragline Excavators

This is the fifth article of a series dealing with the "Maintenance and Upkeep of Motors on Electric Shovels and Draglines." The subject of "How to Maintain Motor Bearings" was treated in our September 1921 and October 1921 numbers and the "Rewinding of Induction Motors" in our January 1922 and February 1922 numbers.

Overheating of induction motors may be due to one or more of the following causes:

(1) Overloading.
(2) Operation on improper voltage.
(3) Single phase operation.
(4) Open circuited coils.
(5) Short circuited coils.
(6) Improper connection of windings.
(7) Insufficient ventilation.

Overloading

The overheating of a motor due to overload is not apt to be a common occurrence as motor sizes on excavating shovels have been determined as a result of long experience and are generally found to be suitable for the service. Occasions will doubtless arise, however, when the motor equipment will actually be overloaded and overheating will result.

If, after careful investigation, it is determined that the motor is actually overloaded, the next step is to look for the cause of the overload. This will be found in a great many cases to be due to poor adjustment, or worn out mechanical parts of the shovel mechanism, or an attempt to perform service beyond the capacity for which the shovel was designed. Trouble caused by improper mechanical adjustment will probably be the most common —these will include improperly aligned gearing, tight bearings, dragging brakes and clutches, sprung shaft and other defects of like nature. Troubles due to loading of the equipment beyond its capacity may occur from using a larger bucket than that for which the shovel was designed to operate in the given material. For instance, it would be unreasonable to expect a shovel designed to work with a 2-yard bucket in handling coal to operate satisfactorily when using the same size bucket in iron ore.

Troubles due to overloading are apt to cause great damage to the motors and will eventually result in burn-outs if the cause of the overload is not removed.

Operation on Improper Voltage

As the operation of a motor on a voltage which varies materially from the normal voltage for which the machine was wound will result in overheating, it is desirable to keep the voltage as near the normal value as possible. In case the voltage at the motor terminal is considerably higher than normal, the motor will be found capable of exerting a much greater torque than usual, but will become very hot in a short time. Should the voltage at the motor terminals drop considerably below its normal value, the motor will be found to be incapable of carrying its rated load. In attempting to carry full load, however, the motor will draw a very heavy current from the line which will cause overheating.

Practical experience has shown that the maximum permissible variation of voltage should not exceed 10% above or below normal value, and that beyond this value, operation will be found to be very unsatisfactory.

Single Phase Operation and Open Circuited Coils

Should the speed of an induction motor decrease without apparent reason, and the motor fail to carry its rated load, an open circuit in one of the rotor phases is indicated, either in the motor winding itself or in the external connections to the starting resistance. If the motor is operated under such conditions, it will carry only a small fraction of its rated load, will run at reduced speed, and will overheat badly.

When such conditions arise, all connections between the secondary winding and the resistance should be examined, and if no loose connection is found, the motor should be taken out of service for an examination of the winding.

In case an open circuit occurs in one phase of the stator winding, or in the external connections, the motor will continue to operate at full speed and will carry its rated load, provided it is running at the time the open circuit occurs. The motor will run very hot, however, as the primary current will be approximately twice as large under these conditions as when all connections are properly made. If not in operation at the time the open circuit of its phases occurs, it will be impossible to start the motor as it will be similar in operation characteristics to a single phase induction motor which has no starting torque.

The causes for overheating of A. C. Motors will be continued in our next installment.

A Handy Chart for Determining the Flow Through Pipes

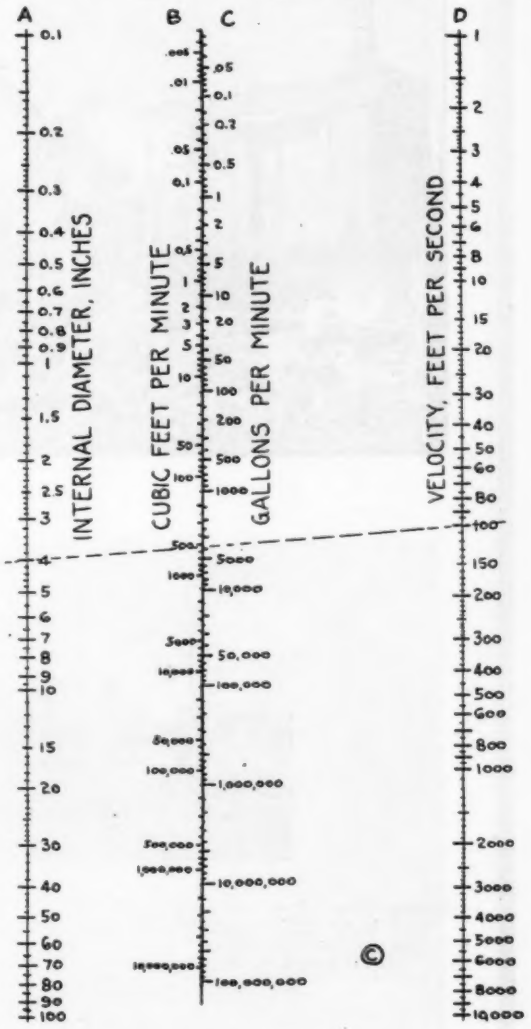
By W. F. Schaphorst

By simply laying a straight edge across this chart any one of these questions may be answered:

1. How many cubic feet will flow through a pipe of known internal diameter at a given velocity?
2. How many gallons?—other conditions being the same as in (1).
3. What will be the velocity in feet per second knowing the diameter and cu. ft. of flow per minute?
4. Same as (3) except that the flow is given in gallons per minute.
5. What diameter of pipe must be used to carry a given number of cu. ft. per minute at a given velocity?
6. Same as (5) except that quantity is in gallons per minute.

For example, how many gallons per minute will flow through a 4-inch pipe at 100 feet per second velocity?

The dotted line shows how it is done. Connect the 4 (Column A) with the 100 (Column D) and locate the intersection with the middle column. Column C tells us the answer—very close to 3900 gallons per minute. At the same time column B



A Pipe Flow Chart

gives the equivalent in cubic feet per minute—very close to 525 cubic feet per minute.

The range of the chart, it will be noted, is very great. It will handle a water velocity as low as 1 foot per second, and a steam or gas velocity as high as 10,000 feet per second. The range for pipe diameters runs from 1/10 inch to over 8 feet. The maximum flow shown on the chart is 100,000,000 gallons per minute, or over 10,000,000 cubic feet.

A tough job for a small shovel. This Bucyrus 18-B is g... ock on an apartment house job at Grand Concourse and l... Handy Brothers, who are old timers in the excavati... in New York, are moving the rock on this jo...

Starting work on the Theodore Ro...ment ... This, when completed, will be the ...ment ... Inc., has the contract for the ex...ich, a... rock. Although the shovel, a ...n Buc... it is making fir...ds in t...

Starting the excavation for an apartment house at Grand Concourse and 162nd Street. Fred. Schneider, Inc., is handling this job with a 30-B Bucyrus shovel.

Fred. Schneider, Inc., is doing this basement job at 170th Street and Grand Concourse with an 18-B Bucyrus.

APARTMENT HOUSE CONSTRUCTION IN NEW YORK CITY

The photographs on these pages indicate the progress which is now being made in New York City in apartment house construction. All these views were taken within a radius of one mile in the Bronx and show that in New York City at least there is no lack of building activity.

nt house at 166th Street and Concourse. t house in the world. Fred. Schneider, ch, as the photograph shows, is largely Bucyrus, has seen 18 years' service, in this heavy digging.

An 18-B Bucyrus shovel handling some tough digging on an apartment house excavation at University Avenue and 190th Street. Handy Brothers, who have been doing cellar excavating in the Bronx for the past fifteen years and were one of the first contractors to use shovels for this kind of work, have this contract.

DEVICES YOU OUGHT · TO KNOW ABOUT ·

The Shay Geared Locomotive

Light rail, temporary track, unballasted roadbed, steep grades and sharp curves are transportation difficulties common to excavating work.

The direct-connected, rod-driven locomotive, universally used on railroads and for industrial hauling where roadbed is good and curves and grades not severe, is at a distinct disadvantage in quarry and pit, where track is of a more or less temporary nature. Rod-driven locomotives not only require heavier rail on which to work but have a tendency to derail on curves, impeding the progress of material and slowing up the entire operation.

For successful operation under the difficult conditions obtaining in excavating and similar work, the Lima Locomotive Works, Incorporated, of Lima, Ohio, U. S. A., builds the Shay Geared Locomotive.

The Shay answers every requirement of excavating service. As will be noted from the photograph, the total weight of the Shay is carried on relatively small wheels, each of which is a driver, spaced far enough apart to distribute the weight of the locomotive. The locomotive is supported on trucks, each having a center plate, which permits the truck to turn freely. The frame is stabilized by side bearings so arranged as to permit easy curving and give flexibility.

The multi-cylinder engine, driving through gears, gives a constant torque and produces an even and powerful pull. All the wheels being driving wheels, the total weight of both engine and tender is used for tractive effort. A Shay locomotive of the same weight as a direct locomotive and its tender will produce a much greater drawbar pull.

All wheels are driven by means of gears connected on the driving crank shaft. To compensate for curves the driving shafts are provided with universal couplings and slip joints, giving a flexibility of construction which accommodates itself very freely to curves and uneven track.

There being no counterbalance in the driving wheels, the Shay does not hammer the track, and will operate on rails too light for a rod-driven engine of the same axle load.

The Shay is a grade-climbing locomotive. Unlike the rod-driven engine with its tender, the Shay has no dead weight to pull, and is able to start a heavy load on a steep grade and keep it going.

Rapid acceleration is a Shay feature of prime interest to the excavator. With its superior starting power, rapid acceleration and a strong steady pull that eliminates the necessity of taking slack with the attendant breaking of couplings, the Shay spots quickly and accurately at crusher, dump and weighing machine. Careful tests of a Shay and a rod-driven locomotive demonstrated that the Shay requires 22 per cent. less time to accelerate to speed, and that it spots 11 per cent. quicker, and with much greater accuracy than the rod engine.

The Shay Locomotive in Quarry Work

Other Shay advantages, from the viewpoint of the owner, are ruggedness and dependability. The Shay can be counted upon to stay in service day after day with minimum maintenance attention.

Thousands of these Shay Geared Locomotives are used in excavating and logging operations in the United States and Canada and on American, Cuban, South American and Hawaiian plantations. They are also employed extensively in industrial service, and in mining, stripping, quarrying and excavating work. For further information regarding the Shay Geared Locomotive write the Lima Locomotive Works, Lima, Ohio, using one of the blank postals inclosed in this magazine.

The Record

Howell—"Last night was the hottest night in the year."

Powell—"Not for me. The hottest night for me was when my wife discovered that my pay had been raised and I hadn't told her of it."

Mistaken Identity

"Mister," whined the beggar, "will you give a poor man something for a drink?"

"You bet I will," said the pedestrian, brightening. "How much have you got with you."

SHOTS FROM THE · FIRING LINE ·

Colorado

Pete Chapman is craning a 70-Ton Bucyrus for Arthur, Potter and Allen, General Contractors of Pueblo. They are loading slag ballast for the Missouri Pacific at this place. Mr. Chapman tells us that the machine is an old timer but is in good shape and can still do a good day's work. He also says that Pueblo is looking well cleaned up since the flood and a lot of construction work is going on.

Eastern District

BY E. B. WILLIAMS, NEW YORK

New York City Notes

Never perhaps in the history of New York has it been possible to find so many small shovel jobs as at this time. This work extends from the lower end of Staten Island and Coney Island, includes Brooklyn, Kings and Queens County and well up into the Bronx as far north as the Yonkers line. The work consists principally of large apartment house construction and this work is particularly noticeable in the Bronx along the Grand Concourse from One Hundred and Sixtieth Street to One Hundred and Ninetieth Street. At the corner of the Concourse and One Hundred and Sixty-seventh Street Fred Schneider is excavating for the cellar of what is to be the largest apartment house in the world, The Theodore Roosevelt. It will be twenty stories high, a face of six hundred feet and a depth of over five hundred feet. (Now let Chicago beat that.)

Edward V. Handy and Martin Handy of New York

We recently received this snapshot of Edward V. Handy and Martin Handy, the well-known contractors of New York City, who operate under the name of Handy Brothers, with offices at 106 Field Place in the Bronx. For fifteen years Handy Brothers have been moving dirt and rock on cellar excavation work in and around New York. They were among the first contractors to use steam shovels for this kind of work.

Handy Brothers have no difficulty in keeping their two Bucyrus shovels busy, as four of the photographs on our center page spread in this issue show.

John E. Thomas is operator on one of the Thomas Crimmins 30-B Bucyrus draglines taking off the topsoil excavation on an aqueduct job. Harry C. Ames is firing.

Peter A. Thomas is operating the other Thomas Crimmins 30-B dragline on main excavation for the aqueduct.

J. J. Mangum is pulling the levers and Bill Gaines is keeping the boiler hot on J. J. Harris Company's Type B Erie, excavating basement on 36th Street, between 7th and 8th Avenues, New York City.

W. F. Bell is operating a Class-7 Bucyrus dragline on the summer estate of Mr. N. F. Hoggson, near Bridgeport, Connecticut.

John Marino is using his Bucyrus 14-B excavating a number of basements for two family houses at 80th St. and 5th Avenue, Brookyln, N. Y.

Sandy Adams is operating Scallera Bros. Marion Model 21 digging a cellar for an apartment house at Grand Avenue and Fordham Road, N. Y. City.

Geo. Kingston is operating a Thew shovel for the Allegro Construction Co. in the Bronx.

Work was started a short time ago by Booth & Flynn on the east approaches of the new vehicular tunnel under the Hudson river and connecting New York with Jersey City and Chicago. This tunnel will require about five years to complete.

Thos. Crimmins Contracting Company, Rice and Ganey, and Frederick Snare Corporation have recently acquired contracts from the New York Board of Water Supply. The work in each case is cut and cover and the laying of ten-foot concrete pipe along the present sixteen-foot aqueduct, and they are making good progress now that the early spring sunshine has lent a hand by bringing the frost out of the ground.

Armstrong & Trowbridge of Monticello, New York, have started their Sullivan county highway work. They are installing a Bucyrus 14-B.

Winston & Company are making rapid progress at Hope, Rhode Island, on the Scituate dam work. Two 70-C shovels, two 30-B shovels, a 14-B shovel and one 30-B dragline, all Bucyrus, are employed on this work.

There is a lot we would like to say about the anthracite coal mining district and there was a lot to be said of this part of the world if we had done our saying about a month ago and had told of the big coal tonnage produced in anticipation of the threatened coal strike. Well, the strike is on and idle contractors can't offer much in the way of news.

The Hazelton Chapter of the Miners Institute were treated to a moving picture show a short time ago, and the Shenandoah Chapter a few days after. "The Modern Goliath," a five-reel picture of modern steam shovel work was shown. This picture was taken by the Bureau of Mines of the United States Government in co-operation with the Bucyrus Company. The picture was thoroughly enjoyed by all of the mining engineers, contractors and mine operators and there was a splendid attendance at both exhibits.

J. F. Mulligan Contracting Company of North Wilkesboro, N. C., was awarded two large highway contracts at the recent letting at Raleigh.

Nello F. Teer secured another contract of considerable magnitude. This contract which is in one of the eastern counties of the state carries with it about three hundred thousand yards of borrow. Mr. Teer will employ a dragline for this work. This is the first highway contract in North Carolina upon which a dragline has been installed.

North Carolina with its $500,000,000.00 highway appropriation is doing wonders in the way of road construction. A most competent State Highway Commission and a practical and efficient Highway Engineer are putting forth their best efforts and it looks today very much as though the end of 1922 would see North Carolina well to the front in highway construction.

Lloyd Burley is operating a 14-B Bucyrus shovel for Armstrong & Trowbridge near Middletown, New York.

26477

Indiana

The Cleveland, Cincinnati, Chicago & St. Louis Railway will build 12 miles of second main track from Farmland to Muncie.

Inter-Mountain News

BY H. N. STEINBARGER, DENVER, COLORADO

During early April Mr. E. Flynn, General Superintendent of the C. B. & Q. Railroad, visited Denver and announced that owing to increased business the officials had decided to build in Denver large shops at a cost of about $2,000,000.00. From time to time over a period of several years large Burlington shops have been discussed but owing to the war and post-war conditions the matter was shelved. It is proposed to build the shops at Utah Junction near the present shops of the Denver & Salt Lake Railroad. Some grading will have to be done to prepare the site for the building but this will be comparatively small. It is expected that at least one thousand employees will be required when the plant is completed.

Another announcement of interest to Denver and vicinity is the probability that the Union Pacific Railroad will make extensive changes and improvements in the already large yards and freight houses. At this time no definite information confirming the rumors is available. However, it is stated that the changes are necessary and no doubt the Union Pacific will soon complete their plans and make a formal announcement.

R. J. Champion, steam shovel and dragline operator, dropped in to say hello a short time ago. He returned to his home at Arvada, Colorado, a suburb of Denver about two months ago from Clearmont, Wyoming, where he has been engaged for a number of months in the operation of a 30-B Bucyrus gasoline dragline. Mr. Champion is a good Bucyrus booster. About the 15th of April he returned to Clearmont to reopen the excavation work on the Estate of L. Z. Leiter with the above mentioned 30-B. While at his home in Arvada he spent his time doing general repair and improvement work on his home and grounds. We have a standing invitation to run out and look over his home and sure will accept at the first opportunity. We wish him continued success on his Wyoming job and that he may finish with colors flying. Undoubtedly he will because from all reports he is some "champion" shovel and dragline engineer.

A new road is being surveyed to what is known as Parmalee Gulch which will connect the Bear Creek and Turkey Creek canyon roads. This will make another complete circle trip out of Denver for the thousands of tourists as well as Denver owners of automobiles. As soon as the survey is completed contracts will be let and by early summer no doubt the work will be well under way. This new road will also open up a splendid section of land much of which can be cultivated, therefore the road will serve a double purpose and best of all make a nice piece of work for a number of idle contractors.

Governor Oliver H. Shoup of Colorado has called a special session of the State Legislature for the purpose of enacting new legislation which will permit a construction of flood prevention reservoirs west of and near Pueblo, Colorado, also for construction of the so-called Moffatt tunnel on the Denver & Salt Lake Railroad with State funds. They are both needed badly, the first to protect the city of Pueblo from any future high waters such as caused the terrific floods of June 1921 and the other, the Moffatt tunnel, to eliminate many small tunnels and very heavy grades on the Denver & Salt Lake Railroad and make possible its continued operation during the winter months, at which time many heavy snow storms and slides block the road sometimes for many weeks. As this issue goes to press the road has been blocked for over thirty days with no hope of immediate relief. This makes it necessary for all shipments for points beyond the divide to go by way of the Denver & Rio Grande Railroad to Walcott, Colorado, a very circuitous trip. No doubt both issues will become a law, and of course this will mean tremendous construction work and put into active use much construction equipment now lying idle.

J. H. Wasson, President,
Wilbur O. Russell, Vice-President,
Al. Weir, Secretary,

"Three of a kind." A pretty good hand to draw to, in fact it's almost as good as a "full house." Any other organization, association or institution with a set of officers as big in their line as the above are "going some" and will have to show me. The big three are and have been controlling the destinies of Denver Local No. 91 of the International Brotherhood of Steam Shovel and Dredgemen. Gathered about them as members of this Local are the best bunch of steam shovel engineers, cranesmen and firemen west of the Mississippi. Now if there is any other Local in the country doubts this statement we sure will be glad to talk it over. Talk about "busting records," running steam shovels, chewing up the sides of the Rocky Mountains, building new roads, both highway and railroad, why! we've got the rest of the country skinned a mile. Well anyway part of that statement is true because from the last report all but about three of the members of the Local have lined up jobs throughout the Rocky Mountain section and are in fact chewing up the Rocky Mountains. Here's hoping they all get out pretty soon because there is more money in chewing the Rockies than chewing the rag and when they are out there is time for both.

Iowa

W. A. Cox of Forest City was recently awarded the grading contract on a 30-mile road job. The work calls for 175,000 cubic yards of excavation.

Kansas

The Atchison, Topeka & Santa Fe has been authorized by the Kansas State Charter Board to construct a 43-mile cut-off extending from Eldorado to Ellinor; also a four-mile belt line just east of Eldorado, the latter to be known as the Eldorado & Santa Fe.

Contracts for the building from Satanta, Kan., to a point near Springfield, Colo., have been awarded by the Atchison, Topeka & Santa Fe Ry. to John R. Scott and E. P. White, of Kansas City, Mo., and St. Louis, Mo.

Maine

The Eastern Maine R. R. has applied to the Interstate Commerce Commission for permission to build a new line of railroad in Aroostook, Hancock and Penobscot counties, the line to be 128 miles long, with branches. The road will run from Houlton to Rancroft, a point on the Maine Central R. R., with which the new line will have a junction. The road also proposes to build a branch three miles long to the international border. A supplemental application to build a new line 13.3 miles long in Penobscot county in connection with the proposed construction of the Eastern Maine R. R. also has been filed by the Mattawamkeag & Eastern R. R.

Michigan

Officials of Pickands, Mather & Co. have announced that the Plymouth pit at Wakefield was opened on April 3, giving full-time employment to 100 or 125 men. For some time past a small force of men has been employed on a part-time basis. One shovel is now operated in stripping and another will be put in use soon. Preliminary work—stripping, changing approaches, and moving

and laying track—will take six weeks or more. The company intends to grade several streets in the location this summer, to lay concrete sidewalks throughout the location, and to repair and repaint the company houses.

No extensive operations are contemplated at the pit of the Wakefield Iron Co. until the middle of the summer at least.

Minnesota

Foley Bros. Co., Gilfillan Bldg., St. Paul, Minn., has been awarded contract for grading the Lake Shore Highway from Little Marais to Two Harbors.

Missouri

The St. Louis-San Francisco Railroad has awarded a contract to Grant Smith & Co., of St. Paul, Minn., to build a second main track between Windsor Springs and Valley Park, Mo., about five miles; also for grade reduction at Garnsey and Crocker, Mo., and 3½ miles of second track at Swedenborg, Mo.

Montana

Surveys have been completed for the location and construction of a broad-gauge railroad from Columbus on the main line of the Northern Pacific Ry. southwesterly into the New World mining district. The road will be 83 miles long. Construction will start early in the spring. Designs are now being prepared for a bridge to span the Yellowstone river. All of the engineering work is in charge of J. P. Ernster & A. W. Barker, engineers, of Minneapolis, Minn.

North Carolina

The New Holland, Higginsport & Mount Vernon R. R. will build a 35-mile line, connecting with the Norfolk Southern Railway at Wenona and extending to New Holland.

Notes from the Pacific Coast

Contract has been awarded on concrete to Twohy Bros. Co., Phoenix, Arizona, and Hobart Bldg., San Francisco, by the Maricopa Highway Commission, for the construction of 160 miles of County Highways.

Contract has been awarded to Sharp & Fellows Contracting Company, 533 Central Bldg., Los Angeles, for the grading of 75 miles of railroad for the Atchison, Topeka and Santa Fe Railway, from Yampai to Griffiths, Arizona. Total estimated cost of the construction of this road, including all tracks, etc., is $8,700,000. R. B. Ball, 747 Kerckhoff Bldg., Los Angeles, is Chief Engineer of the Atchison, Topeka and Santa Fe R. R.

Rhodes & Price, Hilt, California, who were recently awarded a contract for grading 16.8 miles of road between San Felipe and Los Banos, have sublet 10 miles of this work to W. A. Dontanville, Hollister, Calif.

Contract has been awarded to Daniel Bayles, Biggs, Calif., for 30,000 cu. yds. of excavation for drainage ditches for Drainage District No. 100 at Richvale.

Mr. I. C. Lacey is now operating a 14-B Bucyrus shovel for Mr. W. H. Cowen, in San Francisco.

Plans have been made by Quinton, Code & Hill, Hollingsworth Bldg., Los Angeles, for construction of an extension and addition to the present levees along the Kern River, for flood protection of the City of Bakersfield. The city is about 10 ft. lower than the bed of the river and the present levee system would be inadequate to protect the city from unusual floods. The work planned involves the construction of a new levee on the south side of the river, and means the moving of about 185,000 cu. yds. of earth.

California & Oregon are linked together by another railway line in the completion of the new California Northern Railroad, soon to be open for operation. It extends from Brookings, Ore., to Smith River, a village in the redwood timber area of Del Norte County, Calif.

The work on the Siaz levee which the Colorado River Land Company agreed to do is completed. The work has been pushed rapidly with H. S. Abbott in immediate charge and has been a big and expensive undertaking. The completion of this work assures the protection of a large section of land in Mexico and will reduce the danger in the flood season if there should be an unusually high river. The Siaz levee is one of the important lines of defense against flood waters for the Imperial Valley and is valuable to this side of the border as well as to the Mexican lands. The work cost upwards of $75,000.00.

Mr. M. E. Martin, who last year was operating a Class-7 Bucyrus dragline for the Corcoran Irrigation District, Corcoran, Calif., has since then been running a Marion 21 for the Fort-Belknap Irrigation Company at Chinook, Montana. This Company is starting on an operation involving 34 miles of ditch.

Contract has been awarded to the United Dredging Company, Los Angeles, for dredging in San Diego harbor involving 150,000 cu. yds. from bulkhead line to pier head line. Channel 150 ft. wide, 650 ft. in shore from pier head line.

The Table Mountain and Thermalito Joint Irrigation Districts, near Oroville, were formed March 24th, by an election held by County Supervisors of Butte County. Proposed structures for the two Districts include two earth-fill dams, ditch systems, and pipe, ranging in size from 6-inch to 30-inch diameter; S. J. Norris, Oroville, is Consulting Engineer for the Table Mountain District and J. M. Howells, San Francisco, Consulting Engineer for the Thermalito District. It is planned to call for bids for the construction of the joint system during the coming summer.

Contract has been awarded the Ajax Dredging Company of San Francisco who bid $0.37 cu. yd. or about $140,600.00, for approximately 380,000 cu. yds. of excavation of drainage ditches for Reclamation District No. 2054.

The San Vincente Mill & Lumber Co. has closed a deal by which it will take over the stand of timber of the Loma Prieta Mill & Lumber Co. Henry Stoddard, manager of the San Vincente mill, announces that they will have over a two-year run at Loma Prieta and that the milling work will be done at their mill, at the northern end of the city. There is a branch of the Southern Pacific running from Aptos to Loma Prieta and the logs will be taken over the branch to Watsonville line and then the Davenport line to the mill.

Plans are being made by the Magma Copper Co., Superior, for the construction of a railroad, mill and smelter; to be financed by the issuance of $4,000,000.00 of bonds.

Plans are being made by the Pacific Electric Railway Co., Los Angeles, and application has been filed with the State Railroad Commission for the construction of a mile tunnel for the Hollywood and Glendale Lines. Estimated cost is $1,750,000.00.

Contract has been awarded to the Utah Construction Co. of Salt Lake City and San Francisco, by the Union Pacific Railway Co. of Los Angeles, for the grading of 12 miles of new roadbed from Whittier to Santa Fe Crossing at Futterton, work also involving the construction of a 400 to 500-ft. tunnel, culverts, drainage structures, and some paving and curbing.

Imperial Irrigation District made formal application on February 28th to the state bond commission for permission to issue $7,500,000.00 in securities to pay for purchase of the mutual water company properties and a drainage system.

Mr. William Hogan, a well-known dragline operator in California, was a recent visitor in San Francisco. He has recently been on a Bucyrus Class-9½ dragline for

the Imperial Irrigation District and has just left a job running a Lidgerwood at Knight's Landing, California.

The Third Annual Convention of the Associated General Contractors, Pacific Northwest Chapter, was held at the Multnomah Hotel, Portland, on March 10th and 11th. The convention was well attended by the contractors of the Northwest, and is probably the best meeting held so far.

C. P. McDowell is handling the levers on the Clemons Logging Company's 18-B Bucyrus shovel at Melbourne, Wash.

The Booth-Kelly Lumber Co. are about to resume logging operations after an idleness of fourteen months. They expect to start their 18-B Bucyrus shovel to work the first of May.

Ohio

The Cleveland, Cincinnati, Chicago & St. Louis has applied to the Interstate Commerce Commission for authority to construct a 3.5 mile cut-off in Delaware County. This company, in conjunction with the Peoria & Eastern, and the Lake Erie & Western, have been petitioned by the city of Bloomington, Ill., through the Illinois Commerce Commission, to separate their grade at South Main street in that city.

Oklahoma

The Missouri, Kansas & Texas Ry. is making a preliminary survey for a branch line from Chetopa south into the newly discovered coal fields of southern Kansas and northern Oklahoma.

St. Louis Items

BY A. B. KOENIG

R. G. Hill & Co., Knoxville, Tenn., and not I. W. R. Thompson as we erroneously reported in last issue, were awarded contract for excavating approximately 170,000 yards for the River Terminals at Memphis, Tenn.

Grant Smith & Co. have their various steam shovel jobs on the Frisco R. R. going full blast and are figuring on completing this work way ahead of contract time.

R. M. "Mique" Quigley stopped off a day on his way East from Denver, Colo.

Jos. E. Nelson & Sons are installing a water pipe line for the Illinois Central R. R. in southern Illinois.

C. P. O'Reilly, 624 Wainwright Bldg., have 18,000 yards of road work near St. Marys, Mo., 43,000 yards at Linneous, Linn County, Mo., and 57,000 yards at Milan, Sullivan County, Mo., to sublet.

Lloyd Martin, 611 Manhattan Avenue, Fulton, N. Y., has a good steam shovel outfit idle. Wants a job or will rent it by the month or load material by the yard.

The Walsh Construction Co. were awarded contract for grade reduction on the Illinois Central R. R. near Monee, Ill. About 900,000 yards of material to be moved on this job. Have moved a couple shovels and a big dragline outfit on to it.

Coopers Construction & Service Co., Federal Reserve Bank Bldg., St. Louis, Mo., have 33,000 yards on 5½ miles of road work in Putnam County, Mo., and 30,000 yards on 4 miles in Shannon County, Mo., to sublet.

W. H. Denison came in from Cushman, Ark., to bid on the Missouri Pacific bridge filling jobs on the White River. Denison has 80 teams and a steam shovel outfit idle that he can place on work immediately.

Herbert E. Reagan of Yale & Reagan died in Chicago on April 6th after an illness of about six months. Work was suspended on their Frisco contract for one hour on the afternoon of April 8th while the funeral was taking place in Chicago.

A. W. Riney, Superintendent of Yale & Regan, passed through here with a steam shovel outfit that they shipped from Memphis on to their new Frisco R. R. work west of the city. Riney is going to superintend this job. Shell B. Huckins will be with him.

C. W. Yale of Yale & Reagan expects to leave here for Winfield, Mo., to begin operations on their big dragline job at that point.

The John T. Walbridge Construction Co., of Chicago, have started work on their sewer job in Springfield, Ill., and expect to complete work within less than a year. A bond issue of $175,000 was voted to defray the expenses of this improvement.

The initial step in the plan to give Calhoun County, Ill., an outlet by rail was taken when the Chicago & Alton Railroad led an application to extend its line to a point on the Illinois River opposite Hardin, the county seat of Calhoun County. If the commission acts favorably on the application the Alton will extend its Carrollton-Titus branch from Titus southwest three and three-quarter miles into the Nutwood Drainage District to what is known as Reddish Road. From a point on this extension two miles south of Titus the company will construct a branch to a point on the Illinois river opposite Hardin. This branch will be 1¾ miles long. Ferries will connect Hardin with the rail terminal across the river. At this time there is not a foot of rail in Calhoun County, but with the Alton extension reaching to a point across the river the residents eventually expect to see a bridge constructed.

Southern States Notes

BY C. N. BALLENTINE AND E. J. WILKIE

J. M. Brashear, who has been handling a bridge crane for the Gould Contracting Company, is now running a Marion 21 clamshell for the J. D. Roquemore Gravel Company, Montgomery, Ala.

Henderson Smith Company of Montgomery, Ala., was awarded contract for construction of 7.2 miles of gravel road in Elmore County. This project lies between the Coosa and Talapoosa Rivers.

Keyser & Gillis of Monroeville secured 20 miles of gravel road between Brewton and Sardis Church in Escambia County, Alabama.

E. P. Toulmin of Mobile was the low bidder on 12.5 miles of gravel road in Wilcox County.

W. T. Taylor of Wilsonville, Ala., secured 18.1 miles of bituminous macadam penetration road in Marshall County.

Texas Road Company, Dallas, Texas, was low bidder on 8 miles of bituminous concrete in Cullman County.

Gibson Construction Company of Knoxville, Tenn., were low bidders on 14 miles of gravel road work in Lauderdale County, Alabama. Mr. J. C. Gibson, president of the above company, has been laid up by a mild attack of appendicitis, from which he has recovered.

R. G. Hill & Company of Knoxville, Tenn., have secured work in Memphis Tenn., approximating 200,000 yards.

The Saragossa Mining Company is operating two ten-hour shifts. Vay Daniel and Columbus Tedford are running, and Vers Chandler and Walter Self craning the 175-B Bucyrus. Joe Yarborough is loading coal with an 18-B Bucyrus.

Stripping at Manchester, Alabama, is being done with a 175-B Bucyrus. Otis Burns and Mr. Ray are operating and George Shaw and Oscar Smith craning.

High water in the Mississippi River and its tributaries is causing a shut-down to levee and drainage work in the states along the river.

The Eudora Western Drainage District will receive proposals on May 10th for over three million yards of work in connection with the drainage of Chicot County, Arkansas. Baxter Engineering Company of Little Rock are the engineers.

The Caddo Levee Board at Shreveport, La., received bids on April 19th for enlargement work on Cross Bayou.

Smith Bros., of Alexandria, will start May 1st spreading gravel on the roads which they constructed in Bienville Parish, La.

Bids were to have been opened April 3rd, by the Louisiana Highway Commission at New Orleans for the construction of road work in Bienville Parish, La. Due to some changes the opening will take place the early part of May.

Tennessee

The Chattanooga-Crossville R. R. will build a railroad from Chattanooga to Crossville, 25 miles distant, to connect with the Tennessee Central Ry. at Crossville. C. E. James, of Chattanooga, Tenn., is the manager.

Texas

The Beaumont Great Western Ry. and the Trinity & Sabine Ry. which are reported to have been bought by R. C. Duff, of Houston, have plans for extending these lines, respectively, from Wells to Waco, 100 miles, and Colmesneil to Jasper, twenty miles. These roads at the present time are a part of the system of the Missouri, Kansas & Texas Ry.

Canada

Eastern News

BY J. M. WARD, MONTREAL

The Provincial Government of Quebec, Department of Highways, has rejected all tenders received for the Montreal-Sherbrooke road claiming that they were too high. New tenders are to be called.

A big program of maintenance work with patrols is being inaugurated on the Quebec highways.

Frank Walters of Lennoxville, has been awarded contract for eighteen miles of gravel road on the Montreal-Mount Laurier section.

The Provincial Highways Board of Nova Scotia has let over 125 miles of gravel road this spring.

Tenders will be called shortly for the new highway from St. Hyacinthe to St. Lambert, Que.

"Hank" Puffer, formerly with the General Equipment Company is back at his old quarters with the Canadian Equipment Company, Montreal.

Bill Normand, shovel engineer, is now located in Montreal.

Jack Buist, shovel engineer, was a recent caller at our office.

Things are beginning to look up in the construction line. Inquiries for equipment are frequent, which denotes a somewhat better feeling. It is hoped that this season will give a good account of itself.

Toronto and Vicinity

BY C. F. ENGLAND, TORONTO

The Bates & Rogers Construction Company of Chicago have recently been awarded contract from J. P. Porter, Standifer & Porter Brothers for the construction of about 28 concrete cribs. These will be built on pontoons and floated out to position, afterwards forming part of the harbor at Port Weller on the Welland Ship Canal.

We understand that the Government will shortly call for tenders on section three of the Welland Ship Canal. This section has since the war been under construction most of the time by Doheny, Quinlan & Robertson, Ltd., and has been worked on a percentage basis.

The contract for excavating on the new road between Markham and Whitechurch (40,000 yards) was let for 29 2/3c. per cubic yard, the lowest bid; the highest bid being 44c. There were 13 bidders. The average haul on this work is 400 ft. This is the first considerable excavating job let in this vicinity for 1922 and for that reason the prices are interesting. The contractor on this work is W. T. Siazza, Toronto.

York County Commission have started work on highways. This county expects to let some additional road contracts early in June.

Mr. E. A. James, of the firm James, Proctor & Redfern, Consulting Engineers, advise that they started work on sewers and excavation on April 17th at Aurora and Orillia, Ont.

E. G. Law & Company, Toronto, has secured the road construction contract from York County covering pavement amounting to approximately $20,000.00.

The Toronto Transportation Commission started relaying tracks on April 15th and traffic has been diverted on King Street between Church and York Streets.

It is understood that York Township is seeking legislation to have the Toronto Transportation Commission extend their lines through the Township. Legislation for so doing has been granted in the case of Leaside, to the northeast of Toronto.

An interesting bridge repair job has just been completed at Belleville, Ont. The bridge spans a portion of Belleville Bay on Lake Ontario and was damaged by collision of a barge last year. It was carried on by the Highway Department through the past winter. The concrete for the new piers was placed when the temperature averaged below zero. Temporary enclosures were placed over the piers and heated to a suitable working temperature for mixing and placing the concrete. Owing to the increased heavy work it was necessary to place in new track and rollers, level up and place tension cables on same. Great satisfaction is expressed by those chiefly benefiting from the improvements noted. The whole of the swinging section now works as good as new. In order to undertake and install the above mentioned parts it was necessary to lift the whole swinging span. This work was completed the latter part of January and the first part of February. The work was carried out under the supervision of Mr. L. V. Love, Mechanical Superintendent of the Department.

An arbitration arising from an excavating contract dispute will shortly announce its decision in connection with the Mount Royal Hotel, Montreal. The contractors for the excavation work, G. T. Atwell & Company, are claiming to be paid between $100,000 and $200,000 over their contract price owing to conditions being entirely different from the understanding when the contract was signed. The Thompson Starrett Company are the defendants. As we go to press the decision has not yet been announced.

Western News

In an endeavor to bring about the adoption of some definite form of connection between the north and south shores of Burrard Inlet at the Second Narrows, a committee will shortly wait upon the Vancouver Board of Trade Commissioners. This decision was reached at a recent meeting of the Burrard Inlet Tunnel & Bridge Co. A communication to the company from the Strauss Bascule Bridge Co., of Chicago, revealed that a double track bridge could be constructed for $1,016,500 while a single-track bridge could be built for $880,000.

It is expected that the government expenditure on the large irrigation project at Oliver, B. C., this year will be approximately $400,000.

Extensions of three of Alberta's northern railway systems, to the extent of 39.5 miles, will be made this year at a cost of $1,006,000 for actual construction, and $514,456 for maintenance and equipment. Necesssary bills for these purposes have been passed by the legislature. The lines to be extended will include the Central Canada and the Edmonton, Dunvegan & British Columbia Ry. All lines will be extended a distance of from eleven to fifteen miles from the present terminus.

The Board of Railway Commissioners has authorized the Canadian Pacific Railway to connect its line

with the Canadian National so as to give access to the Drumheller coal mining region in Alberta.

Mr. J. McCallum, superintendent of steam shovels, Canadian Pacific Ry., Winnipeg, has been seriously ill for several weeks. His many friends will be glad to know that his condition is now so much improved that he is able to resume his duties.

The Yorkton, Sask., Board of Trade has requested an early completion of the 60-mile railway gap between Sturgis and Hudson Bay Junction.

Extension of the lines of the Edmonton, Dunvegan and B. C. Railway, Lacombe & Northwestern Railway, and the Central Canada Railway, of Northern Alberta, averaging thirteen miles each, will be made this summer.

The Canadian Good Roads Association is exerting a determined effort to secure for a Canadian city the fifth congress of the International Association of Roads Congresses due to be held in 1925. The fourth congress of this distinguished association will be held next year in Seville, Spain.

Our best wishes are extended to Mr. and Mrs. S. Sneddon, who are at present spending their honeymoon in Minneapolis. Mr. Sneddon is the genial storekeeper of the Canadian National Railways at Transcona.

TRADE NOTES

The well-known engineering firms of W. R. Heagler & Sons of Paragould, Arkansas, and Hiram Phillips of St. Louis, Missouri, have recently consolidated and will continue business under the name of Hiram Phillips Engineering Company. The new Company will specialize in the construction and improvement of engineering work, including investigations, reports, plans, designs, estimates and specifications. Both firms have had wide experience on several large projects. The offices of the new firm are located in the Fullerton Building in St. Louis, and the Bertig Building, Paragould, Arkansas.

The Freeport Sulphur Company, New York and Freeport, Texas, awarded contract on March 24th to Dwight P. Robinson & Company for the design and construction of a complete sulphur mining plant at Hoskins Mound, Texas. Cloyd M. Chapman has been retained by the Freeport Sulphur Company as consulting engineer.

The company now operates a large sulphur mining plant at Freeport, Texas, consisting of four units which were built by Westinghouse, Church, Kerr & Co. (which has been merged into Dwight P. Robinson & Company) in the period from 1913 to 1918. This plant contains one of the largest installations of oil-burning boilers in the world.

The new plant is one of several industrial undertakings recently awarded to Dwight P. Robinson & Company, and indicates renewed activity generally in industrial construction.

Arthur Whitcraft, M. E., well and favorably known in the steel field, has assumed charge of the manganese steel sales department of The Hadfield-Penfield Steel Company with headquarters at Bucyrus, Ohio. Mr. Whitcraft was for a number of years successively with the Marion Steam Shovel Company, American Locomotive Company, and New York Central Railroad. He was in charge of erection, operation and supervision of heavy excavation machinery.

Mr. Whitcraft is at present a Captain in Officers Reserve Corps, U. S. A.—Commanding 401st Ordnance, (G. H. Q.), Maintenance Company.

The annual meeting of the National Highway Traffic Association will be held at the Automobile Club of America, 247 W. 54th Street, New York City, on Friday, May 12, 1922. Elmer Thompson, 247 W. 54th St., is secretary.

REVIEW OF BOOKS and CATALOGS

We shall be ... to ... this col... catalog...

CATERPILLAR MOUNTING TYPE SHOVELS. This 2-page ... road-Type Shovel Bulletin A-1 publis... Company describes in detail this la... ...elopment ... the application of caterpillars to excavating machi... The Bucyrus Company, who was the first ... line excavators and small revolving sh... pillars is now the first to build a cater... for all sizes of railroad-type shovels. ... supplement will be of interest to all ow... of railro... type shovels. Copies may be obtained fr... the *Bucyr... Company, South Milwaukee, Wis.*

BUCYRUS 30-B OIL SHOVEL DE... Bucyrus Company recently announced ... gasoline shovels, their 30-B. They ... to equip this machine with a Diesel-t... uses crude oil as fuel. The low cost ... possible tremendous savings in fuel. ... engine, and the costs of shovel operatio... are fully described in this two-page s... gasoline shovel bulletin recently iss... pany. Copies will be mailed on reque... *Bucyr... Company, South Milwaukee, Wis.*

The Girl: "Did I ever show you ... tooed?"

The Boy: "No."

The Girl: "Well, we can drive a...

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3¼-yard Bucyrus Dipper Ditching Dre... Louisiana. In first-class condition, exc... particulars write:

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1016 Woodward Building Birmi...

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Four Bay City Walkin... Dr...

Florida Drainage & Construction ...
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A SIX-WHEEL SWITCH... TIVE with separate t... locomotive 105,600 pou... ...ver 20,750 pounds. Cylinder... ...diameter, 24-inch stroke. Wheels 44 inches diameter. Boiler pressure 160 pounds. Butt Strap Boiler. Tender two trucks; weight empty 30,342 pounds. Full interstate inspection.

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Don't handicap a good shovel with poor wagons.

USE WESTERNS

The Western Wagon will stand up under your big shovel — look at that one in the picture. At the same time your team will handle the load without overstraining. A frame of channel steel, wood-filled, and other features of design and construction give strength where strength is needed and saves your team.

Any contractor who has used them will tell you that Western Dump Wagons are best for shovel work.

Western

that's why

Send for Bulletin E-21-A

Western Wheeled Scraper Company

Founded 1877

Earth and Stone Handling Equipment

Aurora, Illinois

A general view of one of the pits with the Bucyrus 225-B stripping in the background. This shows the character of the overburden and gives a good idea of how the coal vein lies. The overburden at this point is 12 to 15 feet deep.

The Bucyrus 35-B loading coal into Western 4-yd. dump cars. The dinky track is laid on top of the coal vein, which is about 6 feet thick at this point.